REMARKS

Reconsideration of this application as amended is respectfully requested.

The specification and the abstract gave been revised so as to conform more closely to conventional U.S. practice.

Claims 1-10 have been cancelled in favor of claims 11-24 which, again, conform more closely to conventional U.S. practice.

Originally presented claims 1-8 and 10 were rejected as being unpatentable over Janes et al in view of Decker et al. The newly presented claims have been drafted in such manner as to distinguish applicant's invention more clearly over the disclosures of each of these refererences, regardless of whether they are considered individually or in combination with one another.

A soundboard constructed in accordance with the invention comprises a core plate having two faces on at least one of which is adhered a plurality of single layer, fibre coating sections. Each of the fibre coating sections is composed of elongate fibres embedded in a carrier and each of the coating sections is arranged on the face of the core plate in such manner that the fibres are multidirectional. It is respectfully submitted that neither of Janes et al nor Decker et al discloses a construction of this kind.

Janes et al discloses a compression molded composite sheet of multiple layers of epoxy impregnated graphite fibres. This characteristic of the Janes et al construction is best shown in Figure 8. Furthermore, the several layers of the

Janes et al construction are assembled in such manner that the fibres extend in different directions. Each layer itself, however, contains fibres which are unidirectional. It is respectfully submitted, therefore, that there is no disclosure in Janes et al of a core plate on at least one face of which is a single layer fibre coating having multidirectional fibres therein. In support of this observation reference is made not only to Figure 8, but also to column 5, lines 4-16.

Decker et al discloses a layer 32 of graphite fibres which clearly are unidirectional. See column 3, lines 59-62. Decker et al also discloses a thin cloth fabric layer 34. This, therefore, is neither a fibre coating nor is it a single layer coating. Further, Decker et al discloses a woven polymer fabric 30 which is not a single layer. The same observation applies to components 34a and 36. Furthermore, Figures 4 and 7 of Decker et al do not relate to soundboards. Instead these figures relate to guitar necks.

It is believed to be clear from the foregoing brief analysis of the Janes et al and Decker et al references that neither of such references discloses or suggests the construction recited in the newly submitted claims, namely, a core plate having two faces on at least one of which a plurality of single layer fibre coating sections are adhered and wherein the coating sections are so assembled that they are multidirectional. Not only does neither of these references discloses or suggest the claimed construction, but neither of such references contains any suggestion which would lead a person skilled in the art to modify the disclosure of

either reference in such manner as to arrive at a construction approaching or equivalent to that recited in the claims.

Independent claim 11 recites all of the above characteristics which distinguish applicant's construction over the prior art. Each of claims 12-20 depend, ultimately, on claim 11 and, accordingly, distinguishes over the references for the same reasons given in support of the parent claim. These claims, therefore, are believed to be allowable.

Claim 21 is an independent claim and distinguishes over the references for the reasons given in support of claim 11. Claim 21 distinguishes over claim 11 by specifying that at least some of the fibre coating sections are adhered to one of the faces of the core plate and that, of these sections, at least some are spaced from others. These characteristics of applicant's construction are not even remotely suggested by the references.

Claim 22 also is an independent claims and distinguishes over the prior art, inter alia, by requiring the core plate to be sandwiched between and adhered to a pair of fibre coatings. A sandwich construction of this kind is neither shown nor suggested by the references. Claim 22 also requires the coating sections to be arranged on the core plate in such manner that the fibres of at least some of the sections are multidirectional and so that at least some of the sections of at least one face of the core plate are spaced apart by gaps. Again, nothing in the references even remotely suggests this construction.

Each of claims 23 and 24 depends, ultimately, on

claim 22 and, accordingly, distinguishes over the references for the same reasons given in support of the parent claim.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **VERSION WITH MARKINGS TO SHOW CHANGES MADE**.

It is believed this application now is in condition for allowance. Such action is requested.

The Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 12-0755.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The paragraph beginning at line 2 of page 1 has been amended as follows:

-- The invention relates to a soundboard of composite fibre material construction [comprising at least one fibre coating consisting of long fibres and carrier material] for use for an acoustic musical instrument, particularly a bowed stringed instrument. --

The following heading has been inserted between lines 7 and 8 of page 1 as follows:

-- **BACKGROUND OF THE INVENTION** --

The paragraph beginning at line 3 of page 2 has been amended as follows:

-- This object is achieved according to the invention [in that the] by the provision of a soundboard formed by a fibre coating [2 is] of single-layer and at the same time multidirectional construction. --

The following heading between lines 4 and 5 of page 2 has been inserted as follows:

-- **SUMMARY OF THE INVENTION** --

The paragraph beginning at line 1 of page 5 has been amended as follows:

-- The requirement [formulated in the feature of Claim 1] for a single-layer and at the same time multidirectional fibre coating defines a layered fibre structure which in one single layer changes its fibre direction. In this case the fibres of individual fibre groups

[have - according to Claim 4 -] extend in the same direction, that is to say they are oriented as if "combed". Thus this is not a tangled fibre layer in which the fibres are likewise disposed multidirectionally; whereas in the tangled fibre coating the individual fibres are "mixed up together", that is to say disposed randomly, in the fibre coating according to the invention due to the "combed" arrangement as fibre groups the individual fibres form common linear fibre patterns. [This is shown by way of example in Figures 1 to 3;] In contrast to the tangled fibre coating in which the individual fibres overlap at any angles, because of the "combed" fibre orientation in the fibre coating according to the invention possible overlaps predominantly have small angles between individual fibres. --

The paragraph beginning at line 5 of page 6 has been amended as follows:

-- **THE DRAWINGS**

Preferred embodiments of the invention are shown in the accompanying drawings wherein:

Figures 1a, 1b, 2, and 3 are diagrammatic views illustrating a core plate on which coatings of fibres are applied; and

Figure 4 is an isometric view of a core plate sandwiched between multiple layers of fibre coatings.

DETAILED DESCRIPTION --

The paragraph beginning at line 6 of page 6 has been amended as follows:

-- The fibre coating according to [Claims 1 to 8]

the invention can basically be produced by various methods. One possibility is offered by the hand lay-up lamination of the core plate. Whilst this method only requires a small investment, it is very time-intensive for this and less reproducible than other methods. Therefore, [Claim 9 describes] an alternative method, namely the production of a so-called prepreg (pre-impregnated fibres) also is disclosed. A prepreg constitutes a semifinished product which is pre-impregnated with usually thermoplastic or thermosetting carrier material (matrix). It offers the advantage that the very complex operation of impregnation of the fibres with the matrix resin is carried out separately from the actual coating of the core plate. This operation is very important for the quality and the characteristics profile of the subsequent composite fibre material and is carried out on a prepreg system under controlled and reproducible conditions [see Ehrenstein, G.W.: "Faserverbund-Kunststoffe", Munich-Vienna 1992]. Although textile layer structures and meshes of the most varied forms are offered as prepregs, they do not have the features [set out in Claims 1 to 8] of the invention. In the past multidirectional prepregs have always been built up as a crosswise mesh or as a combination of several unidirectional laminates. Thus they have a higher weight per unit area, which is disadvantageous in the manner referred to, than the multidirectional and at the same time single-layer fibre coating according to the invention. --

The paragraph bridging pages 6 and 7, beginning at line 23 of page 6 has been amended as follows:

-- In individual cases, namely when the soundboard is used for musical instruments in which the static loading due to the string tension acting on them is such that part-zones of the soundboard are subjected to no or only very slight static loads, it is advantageous to reduce the vibrating mass of the soundboard in that [- according to Claims 5 and 10 -] no composite fibre coating is provided in these part-zones. Thus in this case only those part-zones of the core plate which are subjected to strong static loads are provided with the strengthening fibre coating. --

The paragraph beginning at line 3 of page 7 has been amended as follows:

-- In the part-zones which are not coated with composite fibre material the physical properties of the soundboard, particularly in the case of the preferred use of balsa wood as core plate material, are provided by the core plate itself. Furthermore, a thin layer of solid wood (preferably of spruce or maple wood) which takes up the total area of the soundboard preferably applied to each face of the core plate in order additionally to increase the total bending strength of the plate in the zones of the plate which are not provided with composite fibre material. Since particularly in the case of the preferred use of carbon fibres the fibre coating has a very high density, due to the partial coating, [according to Claims 5 and 10] a considerable saving is made on the vibrating mass and thus the sound radiation of the soundboard according to the invention is substantially increased. --

The paragraph beginning at line 13 of page 7 has been amended as follows:

-- When the soundboard according to the invention is used for musical instruments in which the soundboard is subjected to strong static loads in part-zones (as the case with bowed stringed instruments for instance in the top plate zone below the fingerboard) it is provided [- according to Claim 10 -] that the multidirectional fibre coating is of multi-layer construction in the said part-zones which are subjected to strong static loading. The associated (and in fact unwanted) increase in the vibrating mass is compensated for by the feature of only partial composite fibre lamination of the core plate 1. --

The paragraph bridging pages 7 and 8, beginning at line 21 of page 7 has been amended as follows:

-- The changes in direction 6 of the fibres 2 of the multidirectional run of the fibres are shown in Figures 1 to 3. These changes in direction can be abrupt, as can be seen in Figure 1a. This is the case when the fibre coating [according to Claim 5] takes the form of individual strips 3 or individual zones 4 which are separated from one another by gaps. In part-zones 5 the fibre coating is cut away so that [- according to Claim 5 -] the fibre coating 2 is provided only on at least one part-zone of the core plate 1. [According to Claim 6,] [f]Fibre characteristics, such as thread fineness or thread thickness, are variable over the total area of the fibre coating (cf. in Figure 1a the differing fibres denoted by 7 in two zones). --

The paragraph bridging pages 8 and 9, beginning at line 10 of page 8 has been amended as follows:

-- As an alternative to this, Figure 1b shows - using the example of a variant of the invention for use for bowed stringed instruments - the creation of the single-layer multidirectional fibre coating by individual differently oriented strips 3 (which are unidirectional in the illustrated embodiment) which, depending upon position, are designated by L1 to L6a and take up larger part-zones of the total area. The fibre coating of the upper face is designated by L1, L3 and L5 (solid lines) and that of the lower face is designated by L2, L4 and L6 (broken lines). [According to Claim 7 the] The run of the fibres in the upper face differs from the run of the fibres of the lower face. This is the case in the illustrated embodiment with the fibre coating L1 and L2 (in the central zone between the lines A and B), whereas the run of the fibres in the edge zones (to the left of line A and to the right of line B) on the upper face (L3 and L5) is identical to the run of the fibres on the lower face (l4 and L6). At the boundary edges A and B of the strip there is a change in the fibre direction 6: The central strips L1 and L2 (Between the lines A and B) show an angular deviation from the longitudinal direction of the soundboard, whilst the strips in the edge region L3 to L6 are oriented parallel to the longitudinal direction. In this way in the illustrated variant the multidirectional fibre coating [required according to Claim 1] is produced by the differing fibre orientation of the central zone and the edge zones. A "stopping" effect,

i.e. a stiffening in the cross direction, is achieved in this case in the central part, and in fact is achieved not by the conventional crosswise layered construction of several laminates but by the deviation between the run of the fibres on the upper face and the run on the lower face of the core plate 1. The upper face and the lower face of the core plate are always provided in all zones only with one single-layer fibre coating. At the boundary edges of the differently oriented strips 3 or zones 4, overlaps due to production techniques are permitted and provided. As in the example according to Figure 1, part-zones 5 of the soundboard are also not covered with fibres in the variant according to Figure 1b. --

The paragraph beginning at line 5 of page 9 has been amended as follows:

-- The preferred embodiment does not have any abrupt changes of direction, but rather, as shown in Figures 1 and 3, it has continuous changes in direction 6. Not only in this case but also in the case of the abrupt changes in direction of the fibres shown in Figure 1, the fibre zones are oriented as if they have been "combed", and thus the individual fibres form a common fibre pattern. In this case[, according to Claim 2,] the fibre coating has different proportions of fibres per unit area, as is shown in Figure 3 by zones 8 of increased fibre density (proportion of fibres per unit area) and zones 9 of reduced fibre density. As a result the mass coverage (mass per unit area) and physical properties can be better adapted to the loading directions and characteristic

vibrational shapes of the soundboard than is the case with a constant fibre density. --

The paragraph beginning at line 15 of page 9 has been amended as follows:

-- Due to the multiple changes in direction of the fibres[, according to Claim 3] a "stopping" effect is produced in such a way that a stiffening proportion of the fibre coating is also achieved transversely with respect to the longitudinal direction of the soundboard. This "stopping effect", which is illustrated in Figure 3 at a point for example through the run of the fibres (direction of the line 10) which deviates from the longitudinal direction (direction of the line 11) of the soundboard, is provided in the preferred embodiment of the soundboard. As a result the cross stiffness of the soundboard is increased deliberately on some zones. --

The paragraph beginning at line 22 of page 9 has been amended as follows:

-- Also in the embodiments with continuous changes in direction 6 (Figures 2 and 3) it may be advantageous that [- as formulated in Claim 7 -] the run of the fibres on the upper face deviates from the run of the fibres on the lower face of the core plate. --

The paragraph bridging pages 9 and 10, beginning at line 25 of page 9 has been amended as follows:

-- In order when using carbon fibres, which are only slightly damped and therefore sound rather metallic, to produce a damping range of the characteristic vibrations which

corresponds to the "warm" sound of wood, a preferred embodiment of the invention [according to Claim 8] has at least one thin damping layer in at least one part-zone of the total area of the soundboard. A thin outer layer of solid wood, which by preparation or priming and varnishing contributes substantially thereto, is preferably additionally applied to each of the surfaces of the soundboard in order to produce the required damping values of the soundboard. The construction of a segment of the area of the preferred embodiment of the invention is shown in Figure 4: it consists of the core plate 1, multidirectional and at the same time single-layer fibre coating 2 (with zones of increased fibre density 8 and zones of reduced fibre density9), as well as the damping layer 12 and the outer layer 13 of solid wood. In order to make the run of the fibres distinguishable, in Figures 1 to 4 the fibre density (proportion of fibres per unit area) is shown markedly smaller and the fibre diameter is shown markedly larger than is actually the case in the preferred embodiment of the invention. --

The paragraph beginning at line 1 of page 11 has been amended as follows:

-- I claim: --